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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,269	10/23/2003	Raymond Rui-Feng Liao	2003P10141US01	1537

7590 06/21/2007

Siemens Corporation
Attn: Elsa Keller, Legal Administrator
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EXAMINER	
MERED, HABTE	

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
06/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/692,269	LIAO ET AL.	
	Examiner	Art Unit	
	Habte Mered	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/28/05&10/23/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to communication filed on 10/23/2003.

2. Claims 1-21 are pending. Claims 1, 19, 20, and 21 are the base independent claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 1, 10, 12, 13, 15, 16, 18, 20, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudnick et al (US Pub. No. 20020159418), hereinafter referred to as Rudnick in view of Pattara-Atikom et al (Wasan Pattara-Atikom and Prashant Krishnamurthy, "Distributed Mechanisms For Quality Of Service in Wireless LANs", IEEE, June 2003, Pages 26-34), hereinafter referred to as Atikom.

Rudnick teaches a method of providing Quality of Service in a wireless LAN system.

2. Regarding **claims 1 and 20**, Rudnick teaches a method for providing a delay guarantee **(Rudnick teaches providing QoS to WLANs – See Paragraphs 16 and 28)** for each of a plurality of client devices associated with an access point **(See Figure 1 has client devices 3...22 and the BSS as the access point as illustrated in paragraph 24)**, comprising: classifying each of the plurality of client devices into one of a plurality of potential client device types **(See paragraphs 28, 29 and 30)**; determining

a desired traffic load for the plurality of client devices **(See Paragraphs 38, 40 and 41 and Tables 1 and 2)**.

Rudnick fails to teach allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load.

Atikom presents a tutorial on the different mechanisms for Quality of Service in wireless LANs.

Atikom discloses allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load. **(See on Page 28, in the 2nd Column the last 2 paragraphs and on page 29 the entire 1st column)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rudnick's method to incorporate a step of allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load. The motivation to allocating shaper intervals as a QoS parameter is to avoid redesign of the existing MAC protocol as illustrated by Atikom on page 26, Column 1:11-18.

2. Regarding **claim 21** Rudnick teaches an apparatus comprising a processor; a communication port coupled to the processor and adapted to communicate with at least one device **(See Figure 1, the BSS that acts as an AP has a processor called the central coordinator that processor is an Access Point and has a communication port to other stations See Paragraphs 23 and 40)**; and a storage device **(It is inherent for such a central coordinator to have some form of storage device to**

store protocol, program, scheduler logic etc...) coupled to the processor and storing instructions adapted to be executed by the processor to: classify each of a plurality of client devices into one of a plurality of potential client device types **(See paragraphs 28, 29 and 30)**; determine a desired traffic load for the plurality of client devices **(See Paragraphs 38, 40 and 41 and Tables 1 and 2)**.

Rudnick fails to teach allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load.

Atikom discloses allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load. **(See on Page 28, in the 2nd Column the last 2 paragraphs and on page 29 the entire 1st column)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rudnick's method to incorporate a step of allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load. The motivation to allocating shaper intervals as a QoS parameter is to avoid redesign of the existing MAC protocol as illustrated by Atikom on page 26, Column 1:11-18.

3. Regarding **claim 10**, Rudnick teaches a method, further comprising: allocating bandwidth to each of the plurality of client devices. **(See Tables 1 and 2)**

4. Regarding **claim 12,** the combination of Rudnick and Atikom teaches a method of further comprising determining a reference time for first client device in of the plurality of client devices based on a shaper interval associated with the first client device. **(See**

on Page 28, in the 2nd Column the last 2 paragraphs and on page 29 the entire 1st column)

5. Regarding **claim 13**, the combination of Rudnick and Atikom teaches a method, wherein the allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load includes allocating a shaper interval to a first client device in the plurality of client devices such that the first client device's interframe interval is larger than the shaper interval. **(The entire 1st Column on page 29 and Figure 5)**

6. Regarding **claim 15**, the combination of Rudnick and Atikom teaches a method further comprising: receiving a request for new bandwidth. **(See Paragraph 40 and 41 and Tables 1 and 2)**

7. Regarding **claim 16**, the combination of Rudnick and Atikom teaches a method, further comprising: determining bandwidth consumption for at least some of the plurality of client devices. **(See Paragraph 40 and 41 and Tables 1 and 2)**

8. Regarding **claim 18**, the combination of Rudnick and Atikom teaches a method, wherein the access point **(See Rudnick's Figure 1 has client devices 3...22 and the BSS as the access point as illustrated in paragraph 24)** performs the classifying each of the plurality of client devices into one of a plurality of potential client device types **(See Rudnick's paragraphs 28, 29 and 30)**; the determining a desired traffic load for the plurality of client devices **(See Paragraphs 38, 40 and 41 and Tables 1 and 2)**; and the allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load. **(See on Atikom's**

Page 28, in the 2nd Column the last 2 paragraphs and on Atikom's page 29 the entire 1st column)

9. **Claims 2-5** are rejected under 35 U.S.C.103 (a) as being unpatentable over Rudnick in view of Atikom as applied to claim 1 above, and further in view of Gu et al (Daqing Gu and Jinyun Zhang, "QoS Enhancements in IEEE802.11 Wireless Local Area network", IEEE, June 2003, Pages 120-124), hereinafter referred to as Gu.

10. Regarding **claim 2**, the combination of Rudnick and Atikom, fails to teach a method wherein the client device types include critical compliant, critical non-compliant, non-critical satisfied, non-critical regulated, and non-critical non-responsive.

Gu teaches EDCF which is essentially QoS enhancements in IEEE 802.11.

Gu discloses a method wherein the client device types include critical compliant, critical non-compliant, non-critical satisfied, non-critical regulated, and non-critical non-responsive. **(See Table 1, Page 122 – the 802.11 enhancement for QoS protocol defines 8 different level of priorities and the Applicant's priorities can be associated with any of the priorities in table 1)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Rudnick's and Atikom's method by adding client device types that include critical compliant, critical non-compliant, non-critical satisfied, non-critical regulated, and non-critical non-responsive. The motivation to use various priorities is to provide QoS in a manner compliant with the IEEE 802.11 enhancement for QoS protocol.

11. Regarding **claim 3**, the combination of Rudnick, Atikom and Gu discloses a method wherein the allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load includes allocating a shaper interval of zero to a client device classified as critical compliant. **(See Atikom page 29, 2nd Column, 1st paragraph and see also Gu Table 2 on page 123. Assigning zero is literally possible ac cording to Atikom's and Gu's teachings which is based on the enhanced standard but has the drawback of depriving access to low priority devices.)**

12. Regarding **claim 4**, the combination of Rudnick, Atikom and Gu discloses a method, wherein the allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load includes allocating a shaper interval of zero to a client device classified as critical non-compliant if no traffic overload exists for the access point. **(See Atikom page 29, 2nd Column, 1st paragraph and see also Gu Table 2 on page 123. Assigning zero is literally possible ac cording to Atikom's and Gu's teachings which is based on the enhanced standard but has the drawback of depriving access to low priority devices.)**

13. Regarding **claim 5**, the combination of Rudnick, Atikom and Gu discloses a method, wherein the allocating shaper intervals to each of the plurality of client devices based on client device type classification and the desired traffic load includes allocating a non-zero shaper interval to a client device in the plurality of client devices classified as critical non-compliant when a traffic overload exists for the access point and the plurality of client devices includes at least one client device classified as critical compliant. **(See**

Atikom page 29, 2nd Column, 1st paragraph and see also Gu Table 1 and Table 2 on pages 122-123.)

14. **Claims 6 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudnick in view of Atikom as applied to claim 1 above, and further in view of Awater et al (US 2007/0109980), hereinafter referred to as Awater.

Awater teaches wireless LAN with load balancing.

15. Regarding **claims 6 and 17**, the combination of Rudnick and Atikom fails to teach a method, further comprising: disassociating at least one of the plurality of client devices from the access point if a traffic overload exists for the access point.

Awater discloses a method, further comprising: disassociating at least one of the plurality of client devices from the access point if a traffic overload exists for the access point. **(See Figure 4, step 50 and Figure 5, step 58)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Rudnick's and Atikom's method by disassociating at least one of the plurality of client devices from the access point if a traffic overload exists for the access point. The motivation to use load balancing is to improve roaming as detailed by Awater in paragraph 14.

16. **Claims 7-9, 11, and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudnick in view of Atikom as applied to claim 1 above, and further in view of Grilo et al, (Antonio Grilo, Mario Macedo, and Mario Nunes, "A Scheduling Algorithm For QoS Support in IEEE802.1E Networks", IEEE, June 2003, Pages 36-43), hereinafter referred to as Grilo.

Grilo teaches a scheduling algorithm for QoS support for IE802.11 E networks.

17. Regarding **claim 7**, the combination of Rudnick and Atikom teaches a method, wherein the determining a desired traffic load for the plurality of client devices but fails to teach that the method includes determining a maxMeanAccessTime value associated with the plurality of client devices.

Grilo discloses a method, wherein the determining a desired traffic load for the plurality of client devices includes determining a maxMeanAccessTime value associated with the plurality of client devices. **(See Equation 2 on page 38)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Rudnick's and Atikom's method for determining maxMeanAccessTime value associated with the plurality of client devices. The motivation for determining maxMeanAccessTime value associated with the plurality of client devices is to comply with IEEE 802.11 enhanced standards.

18. Regarding **claim 8**, the combination of Rudnick, Atikom, and Grilo teaches a method, wherein the determining a desired traffic load for the plurality of client devices includes determining an access delay time for a first of the plurality of client devices. **(See Grilo's last columns of Tables 3 and 4)**

19. Regarding **claim 9**, the combination of Rudnick, Atikom, and Grilo teaches a method, wherein determining a desired traffic load for said plurality of client devices includes determining a target Inter-Frame Space value associated with the plurality of client devices. **(See Atikom Page 29, 1st column and see also Grilo's Table 2)**

20. Regarding **claims 11 and 14**, the combination of Rudnick and Atikom teaches a method of allocating bandwidth to each of the plurality of client devices, but fails to teach wherein the allocating bandwidth to each of the plurality of client devices includes determining a target frame rate and shaper interval for a first client device in the plurality of client devices based on a guarantee delay time associated with the first client device and a maxMeanAccess Delay value associated with the plurality of client devices.

Grilo discloses a method wherein the allocating bandwidth to each of the plurality of client devices includes determining a target frame rate and shaper interval for a first client device **(See Tables 1 and 2)** in the plurality of client devices based on a guarantee delay time **(See Delay Bound time on page 38)** associated with the first client device and a maxMeanAccess Delay value **(See Equation 2 on page 38**) associated with the plurality of client devices.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Rudnick's and Atikom's method for allocating bandwidth based on guaranteed delay time and maxMeanAccess Delay value. The motivation for determining maxMeanAccess Delay value and guaranteed delay time associated with the plurality of client devices is to comply with IEEE 802.11 enhanced standards.

21. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ho et al (US 7, 068, 632), hereinafter referred to as Ho in view of Grilo et al, (Antonio Grilo, Mario Macedo, and Mario Nunes, "A Scheduling Algorithm For QoS Support in

IEEE802.1E Networks", IEEE, June 2003, Pages 36-43), hereinafter referred to as Grilo.

Ho teaches setting up and tearing down a session in a basic service set (BSSS) in a WLAN.

22. Regarding **claim 19**, Ho discloses a method of determining whether a request for new bandwidth should be accepted by an access point **(Figure 1- PC/AP STA)**, comprising: receiving a request for new bandwidth to be provided by an access point **(Figure 4, 400)**; determining bandwidth consumption of accepted critical client devices and other client devices associated with the access point **(Figure 4, step 402)**; and accepting the bandwidth requirement if the request does not cause an overload condition for the access point. **(Figure 4, steps 404, 406. 407, 408, and 409)**

Ho fails to teach determining critical access delay for all of the critical client devices; determining the total target frame rate for the access point based on the critical access delay.

Grilo discloses determining critical access delay for all of the critical client devices; determining the total target frame rate for the access point based on the critical access delay. **(See Tables 1 and 2)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ho's method by adding the steps of determining critical access delay for all of the critical client devices; determining the total target frame rate for the access point based on the critical access delay. The motivation for adding the steps of determining critical access delay for all of the critical client devices and

determining the total target frame rate for the access point based on the critical access delay is to take advantage of the various QoS parameters used for implementing the enhance IEEE 802.11 E QoS protocol.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on 571 272 7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HM
6-13-2007

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